FARM FACTS

Saskatoon Berry Orchards - Costs and Returns

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There has been an increase in the number of people interested in small fruit production. Some of these people are currently grain farmers looking for an alternative enterprise to improve their income. Other interested people own an acreage and would like to find an enterprise that would generate a living. A small fruit enterprise is one alternative. The small fruit receiving the most attention has been the Saskatoon berry. A manual on Saskatoon Berry Production, available from the University of Saskatchewan, provides a wealth of production information.

The purpose of this publication is to provide potential Saskatoon Berry producers with an estimate of capital investment, annual costs and returns for a Saskatoon berry enterprise. These estimates are intended as a guide only. Each producer should carefully estimate his/her capital investment and annual costs and returns before investing in an enterprise. Annual costs and returns and capital investment will be very dependent on machinery, building and land currently owned.

The Saskatoon Berry costs and returns budget featured in this factsheet was prepared, by consensus, with a group of five producers and Clarence Peters, Saskatchewan Agriculture and Food Fruit Crop Specialist. Where costs were not known, for example on a trickle irrigation system, Lyle Darwent, Saskatchewan Agriculture and Food Regional Farm Management Agrologist, obtained estimates from commercial suppliers. Dr. Richard St. Pierre, University of Saskatchewan, has provided comment on agronomic practices used in the budget. The following is a brief description of the assumptions that were used for the budget.

- Saskatoon berry bushes (660 per acre) were planted in the second year on ten acres of sandy loam soil. Saskatoons are adapted to a wide range of soil types and soil reaction, but they must have adequate surface and subsoil drainage. They will not tolerate saline soils and areas that retain standing water. A sandy loam soil is most ideal, but they will do well on sandy soils and medium loam soils, if managed accordingly. Heavy clay loams and heavy clays should be avoided. They prefer a pH of 7.0-7.5 but a range from 5.5 –8.0 is satisfactory.

- Two dugouts were an adequate source of runoff water to trickle irrigate ten acres,

- All capital items (the planter was purchased and sold the year after planting was completed) were purchased.

The primary purpose of this factsheet is to provide some basic economic data on a ten acre Saskatoon orchard and to briefly identify and outline several production considerations that new or expanding producers should consider.

Please Note: The size, investment, production practices and selling method assumed in this budget are not intended to provide new or existing producers with guidance on the best method of production. The budget is an attempt to make new and existing producers aware of all costs and returns that must be considered. Other options such as a 3 to 5 acre U-pick orchard or a 20 or 40 acre mechanically harvested orchard may prove to be more suitable.

Budget Information and Assumptions

Table 1 of the budget summarizes all income and expenses associated with the full ten-acre orchard. Table 2 is a per acre summary. Table 3 is a list of the machinery and buildings, with an estimated cost to operate per hour or per year. Table 4 describes the annual direct costs for each year up to the eighth year of production. The eighth year of production represents a fully

developed Saskatoon enterprise. Income and costs will remain relatively unchanged for the next several years.

The initial step in the budgeting process was to establish the machinery, building and land requirements of a ten-acre orchard. The investment schedule (Table 3) summarizes these requirements.

Machinery and Building Costs are estimated as follows:

- The difference between the purchase price and salvage value, divided by the years owned and the annual hours of use, provides an estimate for depreciation per hour.
- Investment cost per hour is determined by multiplying the interest rate times the average annual investment and dividing by the annual hours of use.
- Operating costs per hour include fuel, lubrication and repairs.
- The main building is a 30' x 50' shed with the cooler and freezer occupying part of the shed. The cleaning table is locally constructed.

Dugouts provide the water source for a trickle irrigation system. The irrigation preliminary charge of $1,500.00 is an estimate of the cost of work that must be done by Saskatchewan Water before irrigation rights will be granted.
The source of power is a single-phase hydro line.

Annual costs for the machinery and buildings were established by doing a field operation schedule (Table 4) for each year. Each time a machine is used the hours required are estimated and multiplied by the hourly cost calculated on the investment schedule.

The labor costs per operation and any direct costs for items like fertilizer used in that operation are charged per acre.

For this example, labor is charged at $8.00 per hour, interest at 8% and fuel costs of 50 cents per liter are used.

Yearly Summary of Costs and Returns:

Crop Value

The Yearly Summary of Costs and Returns per acre (Table 2) provides an estimate for the amount of production, cost to harvesting and selling price per pound. The ten-acre orchard was hand picked at 60 cents per pound. Processing costs were 40 cents per pound for a total harvesting cost of $1.00 per pound. The selling price was assumed to be $2.00 per pound, after picking, cleaning, packaging and freezing.

Yield Estimates

Full production was reached in year eight (seven years after planting) at 5000 pounds per acre. Long-term averages are something on the order of 2500 to 3500 lbs/acre. The yield is management-related. There is the occasional year when frost damage reduces yields substantially. Otherwise, yields of 5000 to 9000 lbs/acre are quite possible. However, such yields require **consistent and comprehensive** orchard management.

Direct Costs

RoundUp in Year 1
Producers have estimated a $20.00 per acre cost for RoundUp in year one. The cost of getting land ready for Saskatoons will depend largely on the condition of the land.

Treflan Treflan in Year 2 may or may not be necessary depending on the efficacy of RoundUp the previous year.

Row Spacing

In the budget example, row spacing and in-row spacing has resulted in 660 plants per acre and 5 miles of total row length for the 10 acres. There are a number of factors to consider when determining both row and in-row spacing.
It is suggested that spacing between plants be 1 to 1.5 m, although some growers have been planting using a spacing of 30 to 60 cm between plants. Wider between-row and within-row spacing provide for better orchard ventilation and therefore help reduce the risk of disease problems. Smaller within-row spacing increase early yield, but will require pruning earlier. For the period 3 to 6 years following orchard establishment, a within-row spacing of 0.5 m yields more than twice as much fruit as a within row spacing of 1 m.

Between-row spacing must be adequate to allow passage of equipment for tillage, pest control and harvesting of the mature crop. In general, rows should be at least 1 to 2 m wider than the equipment available. Between-row spacing for U-Pick operations can be as narrow as 3.5 to 4 m. Over-the-row, self-propelled harvesters require a minimum 5 m spacing, while pull-type harvesters require about a 6 m spacing between rows. A between-plant spacing of 1 m and a between-row spacing of 4.5 m requires about 2,400 plants per hectare (approximately 1000 plants per acre).

Grassing Down Row Alleys

In the following budgets, it is assumed that the row alleys would be cultivated each year to keep weeds and rodents under control. A permanent grass cover may be planted in the alleys of an orchard as an alternative to cultivation and may help reduce the use of herbicides. A grass cover may be important for the control of erosion from wind and water. Grass covers create cooler soil temperatures thus decreasing soil moisture loss. A grass cover will help control some weeds, and enables mechanical harvesting even in wet conditions. Grass covers also may help increase winter hardiness because they will compete with the fruit crop for moisture in early to late-fall. Grass covers will have to be mowed and may require some irrigation, otherwise they may compete to some extent with the fruit crop, especially on light, sandy soils. Grass covers may also allow increased damage from rodents, especially if they are not mowed sufficiently.

Suitable grasses must not be invasive. Bunch grasses have a number of desirable characteristics. They are short, relatively drought-tolerant, shade-tolerant, slow-growing, and require little maintenance. A recommended grass cover is Sheep's Fescue, a densely-tufted, low-growing, shade and drought-tolerant, and hardy grass attaining a mature height of 30 to 45 cm if left unmowed. The approximate price is $7 to $8.00 per kilogram.

Grass covers may be established in fall or early-spring. Row alleys should be tilled and rotovated, and the grass seed broadcast using a Gandy applicator at a rate of 45 kg per hectare. The alleys may then be lightly harrowed. Grass seed should not be spread closer than 45 to 60 cm to the fruit plants.

Once the cover is established, additional seeding may be required to fill in any bare spots. Grass covers should be kept mowed at a height of 5 to 10 cm.

Shelterbelt

Shelterbelt establishment is essential. There would not be a cost for the plant material, but there will be some planting and maintenance costs. Costs associated with a shelterbelt have not been included in this budget information.

Trickle vs. Overhead Irrigation

The following budget information is based on a tickle irrigation system. Sprinkler, or overhead irrigation could be used and would includes the use of portable, semi-permanent and permanent sprinkler systems.

The advantages of sprinkler irrigation include effective use where the topography is uneven, or where soils are porous, and the avoidance of excessive water loss from deep percolation or surface runoff . Well-designed sprinkler irrigation systems provide uniform water distribution and can be used for chemical distribution, cooling, or frost protection.

The limitations of sprinkler irrigation systems include a high initial capital cost, the requirements for a dependable source of electrical or fuel power to produce the pressure to operate, water that is relatively free from salt, and a possible increase in disease problems.

Drip or trickle irrigation is frequent or daily irrigation in the form of drops applied at slow rates. Wide-row spacing and limited supplies of water make trickle or drip irrigation the most cost-effective method. The use of sprinkler or surface irrigation requires about twice as much water as does the use of trickle irrigation.

The advantages of trickle irrigation are many. Water is placed where it is needed thus reducing weed growth because less soil surface is wetted. Runoff and deep percolation are reduced, foliage is not watered (thereby reducing the incidence of plant disease), and wind has no effect on the application of water. There is an increased availability of water to the fruit plants because of the frequent applications typical of drip irrigation. Irrigation equipment is semi-permanent, labour and operating costs are lower, other field operations can be carried out simultaneously with irrigation, and fertilizers can be applied through the system. Operating pressures and flow rates are low, therefore the required pumps and piping are smaller and leaks at connections are not common. Because water requirements are lower, conservation of energy and water is easily possible, which is especially important where water is in short supply, or is expensive.

The disadvantages of drip irrigation include the possible clogging of emitter orifices with salts, algae or soil, and the accumulation of salts at the soil surface and toward the fringes of the wetted soil volume. Mechanical or rodent damage is possible, and sunlight and other environmental factors may cause the plastic pipes to crack. Protection of the crop from frost also is not possible.

Fertilizer:

Soil tests and foliar analyses should be done on a regular basis to determine nutrient status of the plants, and compared with optimums that have been established. Very little information is available on requirements for micronutrients.

Herbicides:

Casoron: Casoron 4G is registered for Saskatoon orchards established for 1 or more years. Apply before freeze-up in late-fall. Application must not be made within 9 months of harvest. Apply with a granular applicator or spreader. Casoron is volatile and must be applied during periods when air temperatures will not exceed 10°C. It must not be applied to light, sandy soil. This herbicide is relatively expensive but effective and may provide 2 to 3 years of control.

Linuron: Linuron is applied as a pre-emergent herbicide in early-spring or late-fall when saskatoons are dormant. It should be applied only to established plantings at least 1 year old. Linuron should not be applied more than once per season, nor within 50 days of harvest. Apply as a directed, basal spray to uniformly cover the soil surface and emerged weeds without contacting the crop foliage. Apply before weeds reach 10 cm in height. Rainfall or sprinkler irrigation is necessary within 10 days of application to incorporate linuron into the germination zone of the soil. Once linuron has been applied, the soil should not be cultivated because this will disrupt the action of the herbicide.

Pesticides

Saskatoons, since they are a native species, attract a wide variety of insects that can cause serious economic losses of flowers and fruit. Only Decis is currently registered for these insects. Extensive use may result in mite problems, since it also affects mite predators.

Decis: Apply 3 times per season; once at the green tip stage of flower bud development, once during early flowering (25 - 50% bloom), and once after petal drop, remembering to observe the pre-harvest interval of 21 days.

Fungicides

Topas: Registered for control of *Entomosporium* leaf and berry spot and saskatoon-juniper rust; apply at white tip, petal drop and green fruit stages; the last application must be made no later than 38 days before harvest; may provide incidental control of mummy berry.

Kumulus: Registered for control of *Entomosporium* leaf and berry spot; apply first at flower bud break and at 10 to 14 day intervals while risk of disease persists; pre-harvest interval of 1 day; may provide incidental control of mites.

Nova: Registered for control of powdery mildew; apply at flowering and subsequently twice at 2 week intervals; pre-harvest interval of 14 days.

Funginex: Registered for control of *Entomosporium* leaf and berry spot but no longer suggested for use because of lengthy pre-harvest interval (60 days); may provide incidental control of mummy berry.

Vertebrate pests

Damage by ungulates (mostly deer and elk) during establishment years can cause severe economic losses. Newly established plants are at greatest risk, and may be protected with repellant sprays. Fencing is the only long-term solution. A wide variety of birds ie., robins, starlings, waxwings , crows, etc., can cause serious fruit losses or severe losses to fruit buds during the winter and early spring.

Pruning:

Pruning should be restricted to removal of damaged or diseased material, and to thinning of stems greater than 1 to 1.5 inches in diameter at the base from about 5 or 6 years on. More complex pruning systems require substantially more labour and are therefore more expensive and at this time there is no comprehensive data available to justify this additional cost.

Yearly Summary of Costs and Returns - Total farm

Table 1 provides an estimate of income and costs for a ten acre Saskatoon enterprise. The contribution margin, which is the return above cash costs, is calculated by subtracting cash costs from the gross return (the income). The contribution margin is the amount of money left over to cover depreciation, labor and return on investment.

The Cumulative Contribution Margin represents the cash flow for this enterprise. Negative amounts indicate that an additional injection of cash is required either in the form of an operating loan or cash from savings. The contribution margin minus non-cash costs (depreciation and labor) equals the gross operating profit. The gross operating margin can be negative in the short term, but does need to be positive over the long term. In this budget, the gross operating profit is negative until year seven.

The net present value and the internal rate of return figures are used to compare an investment in a Saskatoon enterprise with other alternatives. They are both based on a 15 year term as it is very likely that a well managed Saskatoon orchard will last at least 15 years. Both indicate a positive return over 15 years.

It is important to recognize the impact of the total production and price on the profitability of a Saskatoon orchard. Changes in the volume of production and price will determine the profitability. Changes to investment and annual operating costs will have a very limited impact on profitability. Thus it is very important that a high level of the day to day management be maintained and that high volumes of top quality product be produced.

TABLE 1

Yearly Summary of Costs & Returns

Total Farm

Yield, Quality and Price have a major effect on the profitability and the success of a Saskatoon berry enterprise.
The yield and prices in this example are not meant to be used as an estimate of future yields and prices, but are provided to demonstrate the budgeting process.
Each producer needs to develop his/her own estimates for yield potential and prices based on the information that is collected from as many sources as is possible.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Total Production (lbs)	0	0	$0.00	0	2,000	10,000	30,000	50,000
U-Pick (lbs)	0	0	$0.00	0	0	0	0	0
U-Pick Net Price	0	0	$0.00	0	0	0	0	0
Hired Pick (lbs)	0	0	$0.00	0	2,000	10,000	30,000	50,000
Hired Pick Net Price	$0.00	$0.00	$0.00	$0.00	$1.00	$1.00	$1.00	$1.00
Harvested (lbs)	0	0	$0.00	0	0	0	0	0
Harvested Net Price	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
GROSS RETURN	$0.00	$0.00	$0.00	$0.00	$2,000.00	$10,000.00	$30,000.00	$50,000.00
CASH COSTS:								
DIRECT CASH COSTS								
Plant material	$0.00	$11,814.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Fertilizer	$0.00	$0.00	$287.00	$287.00	$287.00	$287.00	$287.00	$287.00
Chemicals	$500.00	$1,350.00	$2,700.00	$1,300.00	$2,700.00	$2,000.00	$3,400.00	$2,000.00
Other materials	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Equipment operating & Maintenance	$373.45	$2,922.13	$3,584.26	$3,566.83	$1,122.73	$1,164.02	$1,181.45	$1,164.02
TOTAL	$873.45	$16,086.13	$6,571.26	$5,153.83	$4,109.73	$3,451.02	$4,868.45	$3,451.02
CASH OVERHEAD COSTS								
Memberships and Education	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00
Utilities	$600.00	$600.00	$600.00	$600.00	$600.00	$600.00	$600.00	$600.00
Advertising	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00
Storage	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Interest on operating loan	$98.94	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Misc. overhead (15%)	$206.02	$2,487.92	$1,060.69	$848.07	$691.46	$592.65	$805.27	$592.65
TOTAL	$1,904.96	$4,087.92	$2,660.69	$2,448.07	$2,291.46	$2,192.65	$2,405.27	$2,192.65
TOTAL CASH COSTS	$2,778.41	$20,174.05	$9,231.95	$7,601.90	$6,401.19	$5,643.68	$7,273.72	$5,643.68
CONTRIBUTION MARGIN	-$2,778.41	-$20,174.05	-$9,231.95	-$7,601.90	-$4,401.19	$4,356.32	$22,726.28	$44,356.32
CUMULATIVE CONTRIBUTION MARGIN	-$2,778.41	-$22,952.46	-$32,184.40	-$39,786.31	-$44,187.50	-$39,831.18	-$17,104.90	$27,251.43
NON CASH COSTS:								
Depreciation Machinery & Buildings	$4,334.36	$6,392.73	$6,353.50	$6,318.57	$4,664.79	$4,670.14	$6,474.31	$4,670.14
Labour costs	$644.41	$5,870.71	$7,620.52	$7,739.70	$3,647.02	$3,597.06	$3,626.85	$3,597.06
TOTAL	$4,978.77	$12,263.44	$13,974.02	$14,058.27	$8,311.81	$8,267.20	$10,101.17	$8,267.20
TOTAL COSTS:	$7,757.18	$32,437.49	$23,205.96	$21,660.17	$14,713.00	$13,910.88	$17,374.88	$13,910.88
GROSS OPERATING PROFIT	-$7,757.18	-$32,437.49	-$23,205.96	-$21,660.17	-$12,713.00	-$3,910.88	$12,625.12	$36,089.12

Additional Sources of Information:

1. Growing Saskatoons – a Manual for Orchardists, published by Dr. Richard St. Pierre in 1999, Native Fruit Development Program, University of Saskatchewan and Saskatchewan Agriculture and Food
2. Commercial Saskatoon Berry Production on the Prairies –a Grower's Guide by Sarah Williams, published by University of Saskatchewan, 1994.
3. Manitoba Fruit Guide, 2000 Edition, published by Manitoba Agriculture and Food
4. Commercial Saskatoon Berry Industry, Ag-Ventures , Agriculturre Buisness Profiles, Agdex 238/830-1, published byAlberta Agriculture, 1996.
5. Economics of Saskatoon Berry Production, Farm Facts published by Saskatchewan Agriculture and Food, 1990

TABLE 2

Yearly Summary of Costs & Returns Dollars Per Acre

Yield, Quality and Price have a major effect on the profitability and the success of a Saskatoon berry enterprise.
The yield and prices in this example are not meant to be used as an estimate of future yields and prices, but are provided to demonstrate the budgeting process.
Each producer needs to develop his/her own estimates for yield potential and prices based on the information that is collected from as many sources as is possible.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Total Production (lbs)	0	0	0	0	200	1000	3000	5000
U-Pick (lbs)	0	0	0	0	0	0	0	0
U-Pick Net Price							$0.00	$0.00
Hired Pick (lbs)					200	1000	3000	5000
Hired Pick Net Price					$1.00	$1.00	$1.00	$1.00
Harvested (lbs)							0	0
Harvested Net Price							$0.00	$0.00
GROSS RETURN $/acre	$0.00	$0.00	$0.00	$0.00	$200.00	$1,000.00	$3,000.00	$5,000.00
CASH COSTS:								
DIRECT CASH COSTS								
Plant material	$0.00	$1,181.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Fertilizer	$0.00	$0.00	$28.70	$28.70	$28.70	$28.70	$28.70	$28.70
Chemicals	$20.00	$135.00	$270.00	$130.00	$270.00	$200.00	$340.00	$200.00
Other materials	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Equipment operating & Maintenance	$37.35	$292.21	$358.43	$356.68	$112.27	$116.40	$118.15	$116.40
TOTAL	$57.35	$1,608.61	$657.13	$515.38	$410.97	$345.10	$486.85	$345.10
CASH OVERHEAD COSTS								
Memberships and Education	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00
Utilities	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00
Advertising	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00
Storage	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Interest on operating loan	$8.69	$70.74	$32.69	$27.02	$22.84	$20.20	$25.87	$20.20
Misc. overhead (15%)	$16.10	$248.79	$106.07	$84.81	$69.15	$59.27	$80.53	$59.27
TOTAL	$184.80	$479.54	$298.75	$271.82	$251.98	$239.47	$266.40	$239.47
TOTAL CASH COSTS	$242.14	$2,088.15	$955.88	$787.21	$662.96	$584.57	$753.25	$584.57
CONTRIBUTION MARGIN	-$242.14	-$2,088.15	-$955.88	-$787.21	-$462.96	$415.43	$2,246.75	$4,415.43
NON CASH COSTS:								
Depreciation Machinery & Buildings	$433.44	$639.27	$635.35	$631.86	$466.48	$467.01	$647.43	$467.01
Labour costs	$64.44	$587.07	$762.05	$773.97	$364.70	$359.71	$362.69	$359.71
TOTAL	$497.88	$1,226.34	$1,397.40	$1,405.83	$831.18	$826.72	$1,010.12	$826.72
TOTAL COSTS:	$740.02	$3,314.49	$2,353.28	$2,193.03	$1,494.14	$1,411.29	$1,763.36	$1,411.29
GROSS OPERATING PROFIT	-$740.02	-$3,314.49	-$2,353.28	-$2,193.03	-$1,294.14	-$411.29	$1,236.64	$3,588.71

TABLE 3

SASKATOON PRODUCTION COSTS

INVESTMENT SCHEDULE

Labour cost/hr	$8.00			
Interest on machinery	8.00	%		
Interest on operating	8.00	%		
Interest on buildings	8.00	%		
Gasoline --- ---------->	$2.27	Per Gal	$0.50	Per Litre
Diesel ----- ---------->	$1.82	Per Gal	$0.40	Per Litre

Machine Number	Description	Hp or ft	Purchase Price	Years Life	Salvage Value	Hours Use/yr	Operate $/hr	Deprec. $/hr	Invest. $/hr	Total Per Year Deprec. $	Total Per Year Invest. $
1	Tractor HP=	50	$10,000	20	$1,000	100	$6.16	$4.50	$4.40	$450	$440
2	Rototiller	7	$5,000	10	$600	80	$2.01	$5.50	$2.80	$440	$224
3	Cultivator 3 pt.	7	$800	15	$100	20	$0.31	$2.33	$1.80	$47	$36
4	Modified sprayer	16	$6,000	15	$750	200	$2.95	$1.75	$1.35	$350	$270
5	Disc 3 pt.	7	$1,500	15	$750	10	$0.29	$5.00	$9.00	$50	$90
6	Quad		$4,000	10	$400	50	$3.58	$7.20	$3.52	$360	$176
7	Caseron applicator	3	$2,000	20	$200	20	$0.26	$4.50	$4.40	$90	$88
8	Fert. applicator	20	$2,000	20	$200	2	$0.16	$45.00	$44.00	$90	$88
9	Pneumatic pruner		$5,000	10	$500	450	$2.14	$1.00	$0.49	$450	$220
10	Planter		$3,000	1	$2,700	10	$0.05	$30.00	$22.80	$300	$228
11	V -Trencher		$220	20	$50	2	$0.05	$4.25	$5.40	$9	$11
12	Irrigation pump & lines		$10,000	15	$1,000	720	$2.53	$0.83	$0.61	$600	$440
	Totals		$49,520		$8,250					$3,235	$2,311

Buildings	Description	New Value	Years Life	Salvage Value	Hours Use/yr	Operate $/hr	Deprec. $/hr	Invest. $/hr	Total Per Year Deprec. $	Total Per Year Invest. $
17	30x50 shed	$50,000	20	$10,000					$2,000	$2,400
18	Irrigation prelim	$1,500	50	$0					$30	$60
19	Irrigation hydro	$7,000	50	$0					$140	$280
20	Dugouts	$12,000	20	$0					$600	$480
21	Cooler and freezer	$20,000	20	$2,000					$900	$880
22	Cleaning table	$2,000	20	$200					$90	$88
	Totals	$92,500		$12,200					$3,760	$4,188

TABLE 4

SASKATOON PRODUCTION COSTS

Crop: Saskatoons Year 1 10 Acres **FIELD OPERATIONS SCHEDUL**

Machine Description	Machine Number		Times Done	Speed MPH	Work Rate acres/hr	Machine Hours per oper.	Labour per Oper.	Material & other $/acre	Operating $/acre	Deprec. $/acre	Interest $/acre	Labour $/acre	TOTAL Cost $/acre
Spray herbicide	1	4	3	4	6.21	1.61	1.77	$20.00	$4.40	$3.02	$2.78	$4.25	$34.45
Rototill	1	2	5	4	2.72	3.68	4.05		$15.04	$18.42	$13.26	$16.19	$62.91
Quad	6								$17.90	$36.00	$17.60	$44.00	$115.50
							TOTAL	$20.00	$37.35	$57.44	$33.64	$64.44	$212.86

Crop: Saskatoons Year 2 10 Acres

Machine Description	Machine Numb		Times Done	Speed MPH	Work Rate acres/hr	Machine Hours per oper.	Labour Hours Oper.	Material & other $/acre	Operating $/acre	Deprec. $/acre	Interest $/acre	Labour $/acre	TOTAL Cost $/acre
Treflan	1	4	1	4	6.21	1.61	1.77	$15.00	$1.47	$1.01	$0.93	$1.42	$19.82
Rototill	1	2	5	4	2.72	3.68	4.05		$15.04	$18.42	$13.26	$16.19	$62.91
Treaching	1	11	1	3	6.00	1.67	1.83		$1.04	$1.46	$1.63	$1.46	$5.59
Plant trees	1	10	1	3	1.00	10.00	33.00	$1,181.40	$6.21	$34.50	$27.20	$26.40	$1,275.71
Set irrigation			1		4.00		32.00					$25.60	$25.60
Hand weeding			1				40.00					$32.00	$32.00
Apply orthene	1	4	1	1	0.04	275.03	550.00	$120.00	$250.56	$171.89	$158.14	$440.00	$1,140.59
Quad	6								$17.90	$36.00	$17.60	$44.00	$115.50
							TOTAL	$1,316.40	$292.21	$263.27	$218.76	$587.07	$2,677.72

Crop: Saskatoons Year 3 10 Acres

Machine Description	Machine Numb		Times Done	Speed MPH	Work Rate acres/hr	Machine Hours per oper.	Labour Hours Oper.	Material & other $/acre	Operating $/acre	Deprec. $/acre	Interest $/acre	Labour $/acre	TOTAL Cost $/acre
Fertilize(20-20-20)+soil test	1	8	1	5	9.70	1.03	1.13	$28.70	$0.65	$5.10	$4.99	$0.91	$40.35
Apply orthene	1	4	1	1	0.04	275.03	550.00	$120.00	$250.56	$171.89	$158.14	$440.00	$1,140.59
Rototill	1	2	5	4	2.72	3.68	4.05		$15.04	$18.42	$13.26	$16.19	$62.91
Irrigation	12		45		1.60	6.25	6.87		$71.07	$23.44	$17.19	$247.28	$358.97
Spray caseron	1	7	1	1	2	5.00	5.10	$150.00	$3.21	$4.50	$4.40	$4.08	$166.19
Pruning			1				12					$9.60	$9.60
Quad	6								$17.90	$36.00	$17.60	$44.00	$115.50
							TOTAL	$298.70	$358.43	$259.35	$215.58	$762.05	$1,894.11

Table 4 continued

Crop: Saskatoons Year 4 10 Acres

Machine Description	Machine Numb		Times Done	Speed MPH	Work Rate acres/hr	Machine Hours per oper.	Labour Hours Oper.	Material & other $/acre	Operating $/acre	Deprec. $/acre	Interest $/acre	Labour $/acre	TOTAL Cost $/acre
Fertilize (20-20-20)	1	8	1	5	9.70	1.03	1.13	$28.70	$0.65	$5.10	$4.99	$0.91	$40.35
Apply orthene	1	4	1	1	0.04	275.03	550.00	$120.00	$250.56	$171.89	$158.14	$440.00	$1,140.59
Rototill	1	2	5	4	2.72	7.00	7.69		$15.04	$18.42	$13.26	$30.77	$77.49
Irrigation	12		45		1.60	6.25	6.87	$0.00	$71.07	$23.44	$17.19	$247.28	$358.97
Pruning			1				12					$9.60	$9.60
Spray linuron	1	4	1	4	6.21	1.61	1.77	$10.00	$1.47	$1.01	$0.93	$1.42	$14.82
Quad	6								$17.90	$36.00	$17.60	$44.00	$115.50
							TOTAL	$158.70	$356.68	$255.86	$212.11	$773.97	$1,757.32

Crop: Saskatoons Year 5 10 Acres **FIELD OPERATIONS SCHEDULE**

Machine Description	Machine Numb		Times Done	Speed MPH	Work Rate acres/hr	Machine Hours per oper.	Labour Hours Oper.	Material & other $/acre	Operating $/acre	Deprec. $/acre	Interest $/acre	Labour $/acre	TOTAL Cost $/acre
Fertilize (20-20-20)	1	8	1	5	9.70	1.03	1.13	$28.70	$0.65	$5.10	$4.99	$0.91	$40.35
Spray Decis	1	4	3	4	6.21	1.61	1.77	$120.00	$4.40	$3.02	$2.78	$4.25	$134.45
Rototill	1	2	5	4	2.72	3.68	4.05		$15.04	$18.42	$13.26	$16.19	$62.91
Irrigation	12		45		1.60	6.25	6.87		$71.07	$23.44	$17.19	$247.28	$358.97
Spray caseron	1	7	1	1	2	5.00	5.10	$150.00	$3.21	$4.50	$4.40	$4.08	$166.19
Prunning			1				60.00					$48.00	$48.00
Quad	6								$17.90	$36.00	$17.60	$44.00	$115.50
							TOTAL	$298.70	$112.27	$90.48	$60.22	$364.70	$926.37

Crop: Saskatoons Year 6 10 Acres

Machine Description	Machine Numb		Times Done	Speed MPH	Work Rate acres/hr	Machine Hours per oper.	Labour Hours Oper.	Material & other $/acre	Operating $/acre	Deprec. $/acre	Interest $/acre	Labour $/acre	TOTAL Cost $/acre
Fertilize (20-20-20)	1	8	1	5	9.70	1.03	1.13	$28.70	$0.65	$5.10	$4.99	$0.91	$40.35
Spray Decis	1	4	3	4	6.21	1.61	1.77	$120.00	$4.40	$3.02	$2.78	$4.25	$134.45
Rototill	1	2	5	4	2.72	3.68	4.05		$15.04	$18.42	$13.26	$16.19	$62.91
Irrigation	12		45		1.60	6.25	6.87		$71.07	$23.44	$17.19	$247.28	$358.97
Spray funginex topas kumulus(2)	1	4	4	4	6.21	1.61	1.77	$70.00	$5.87	$4.03	$3.71	$5.67	$89.27
Prunning			1				50.00					$40.00	$40.00
Spray linuron	1	4	1	4	6.21	1.61	1.77	$10.00	$1.47	$1.01	$0.93	$1.42	$14.82
Quad	6								$17.90	$36.00	$17.60	$44.00	$115.50
							TOTAL	$228.70	$116.40	$91.01	$60.45	$359.71	$856.27

Crop: Saskatoons Year 7 10 Acres

Machine Description	Machine Numb		Times Done	Speed MPH	Work Rate acres/hr	Machine Hours per oper.	Labour Hours Oper.	Material & other $/acre	Operating $/acre	Deprec. $/acre	Interest $/acre	Labour $/acre	TOTAL Cost $/acre
Fertilize (20-20-20)	1	8	1	5	9.70	1.03	1.13	$28.70	$0.65	$5.26	$4.99	$0.91	$40.51
Spray Decis	1	4	3	4	6.21	1.61	1.77	$120.00	$4.40	$4.87	$2.78	$4.25	$136.30
Rototill	1	2	5	4	2.72	3.68	4.05		$15.04	$67.82	$13.26	$16.19	$112.31
Irrigation	12		45		1.60	6.25	6.87		$71.07	$146.48	$17.19	$247.28	$482.01
Spray funginex topas kumulus(2)	1	4	4	4	6.21	1.61	1.77	$70.00	$5.87	$6.49	$3.71	$5.67	$91.74
Prunning			1				50.00					$40.00	$40.00
Spray caseron	1	7	1	1	2	5.00	5.50	$150.00	$3.21	$4.50	$4.40	$4.40	$166.51
Quad	6								$17.90	$36.00	$17.60	$44.00	$115.50
							TOTAL	$368.70	$118.15	$271.43	$63.92	$362.69	$1,184.88

Crop: Saskatoons Year 8 10 Acres **FIELD OPERATIONS SCHEDULE**

Machine Description	Machine Numb		Times Done	Speed MPH	Work Rate acres/hr	Machine Hours per oper.	Labour Hours Oper.	Material & other $/acre	Operating $/acre	Deprec. $/acre	Interest $/acre	Labour $/acre	TOTAL Cost $/acre
Fertilize (20-20-20)	1	8	1	5	9.70	1.03	1.13	$28.70	$0.65	$5.10	$4.99	$0.91	$40.35
Spray Decis	1	4	3	4	6.21	1.61	1.77	$120.00	$4.40	$3.02	$2.78	$4.25	$134.45
Rototill	1	2	5	4	2.72	3.68	4.05		$15.04	$18.42	$13.26	$16.19	$62.91
Irrigation	12		45		1.60	6.25	6.87	$0.00	$71.07	$23.44	$17.19	$247.28	$358.97
Spray funginex topas kumulus(2)	1	4	4	4	6.21	1.61	1.77	$70.00	$5.87	$4.03	$3.71	$5.67	$89.27
Prunning			1				50.00					$40.00	$40.00
Spray linuron	1	4	1	4	6.21	1.61	1.77	$10.00	$1.47	$1.01	$0.93	$1.42	$14.82
Quad	6								$17.90	$36.00	$17.60	$44.00	$115.50
							TOTAL	$228.70	$116.40	$91.01	$60.45	$359.71	$856.27

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